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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
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| 10/681,728 | 10/08/2003 | Robbie Thielemans | 920522-94808 | 6705 |
| 23644 | 7590 | 08/08/2005 | EXAMINER | |
| BARNES & THORNBURG P.O. BOX 2786 CHICAGO, IL 60690-2786 | | | HODGES, MATTHEW P | |
| | | | ART UNIT | PAPER NUMBER |
| | | | 2879 | |

DATE MAILED: 08/08/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/681,728

Applicant(s)

THIELEMANS ET AL.

Examiner

Matt P. Hodges

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2879

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 08 October 2003.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-16 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-16 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 08 October 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date 3/8/2004.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

DETAILED ACTION

Specification

The title of the invention is not descriptive. A new title is required that is clearly indicative of the invention to which the claims are directed.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1-3, 8, 9, 12, and 13 are rejected under 35 U.S.C. 102(b) as being anticipated by Curtin et al. (US 5,686,790).

Regarding claims 1, 2, 3, Curtin discloses (see figure 11) a display device including a substrate having an array of addressable light emitting devices, an input means, drive circuitry, electrical connections, and cooling channels (1101a). Drive circuitry is electrically connected to the light emitting devices by way of the electrical connections through the channel layer (1101b). (Column 26 lines 17-34).

Regarding claim 8, the devices are kept inside a controlled atmosphere or vacuum for among other reasons, protection from the environment.

Regarding claim 9, the front faceplate that encapsulates the devices is substantially transparent.

Regarding claim 12, the cooling channels are filled with a liquid or gas cooling fluid.

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Regarding claim 13, the use of a liquid cooling fluid necessitates the use of a propulsion means for that liquid. Thus one would be inherent in the prior art.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1-^{13 met}~~12~~ are rejected under 35 U.S.C. 103(a) as being unpatentable over Kusaka (US 6,201,346) in view of Geusic et al. (US 6,496,370).

Regarding claims 1-5, 7-13, Kusaka discloses (see figure 8) a display device including organic EL light emitting elements (2), drive circuitry (7 and 8), electrical connections (6), and an encapsulant (4). Kusaka further identifies the problem of heat build up on the back of the device between the light emitting elements and the drive circuitry. Kusaka does not appear to specify the use of a cooling channel system in the substrate, however, Geusic, in the same field of endeavor, disclose the use of a cooling channel system in a device substrate for cooling elements on either side of the substrate. Geusic discloses (see figure 1, 2e, and 4) the use of cooling channels (116) formed in the middle of the substrate, interconnects (220) formed between the cooling channels and insulated by layer (222), and high heat conductive substrate or heat sink (202) formed at the top of the channels. Channels are filled with a liquid and propelled by device 412. These channels advantageously allow for heat to be removed efficiently while not restricting the use of drive circuitry on the back of the substrate. Thus, it would have been

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obvious at the time the invention was made to a person having ordinary skills in the art to incorporate the cooling channel system taught by Geusic into the device as disclosed Kusaka in order to advantageously allow for heat to be removed efficiently while not restricting the use of drive circuitry on the back of the substrate.

Regarding claim 6, Kusaka in view of Geusic discloses the device as claimed (see rejection of claim 1 above) but does not appear to specify the use of a semiconductive light emitting device as the light emitting element. However semiconductive EL devices are a well understood alternative to organic EL devices when the device requires additional environmental protection or to lower the cost of manufacture. Thus, it would have been obvious at the time the invention was made to a person having ordinary skills in the art to incorporate the use of a semiconductive light emitting device in the place of the organic EL elements in the device as disclosed Kusaka in view of Geusic in order to advantageously provide additional environmental protection and to lower the cost of manufacture.

Claims 14-16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kusaka (US 6,201,346) in view of Geusic et al. (US 6,496,370) and further in view of Chiba et al. (US 2003/0173891 A1).

Regarding claim 14, Kusaka in view of Geusic discloses the device as claimed (see rejection of claim 1 above) but does not appear to specify the use of the flat panel displays in a tiled display. However Chiba, in the same field of endeavor, discloses the assembling of organic flat panel displays into a tiled display. Using multiple flat panel elements to form a tiled display advantageously allows for an increase in display size. (Paragraph 0009). Thus, it would have

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been obvious at the time the invention was made to a person having ordinary skills in the art to incorporate the use of tiling the flat panel displays into a tiled display as taught by Chiba with the device as disclosed Kusaka in view of Geusic in order to advantageously allow for an increase in display size.

Regarding claims 15 and 16, the tiling as taught by Chiba includes a small space between the display cells, therefore each panel is not directly connected to a neighboring panel and channels would still remain separate on each display panel. However Chiba further teaches the use of a plurality of panels, therefore meaning that at least some panels would be surrounded on all sides by neighboring panels. It has been recognized that one of ordinary skill in the art is expected to be able to make some modifications to the proposed combination in order to maintain functionality. In this case it would have been obvious, and required, to combine the cooling channels at some point outside of the panel, in order to feed the cooling material to central tiles.

Conclusion

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Lovgren et al. (US 5,159,529) discloses the use of a cooling system to reduce heat from a substrate.

Seshan et al. (US 6,377,457) discloses the use of a substrate including cooling channels to dissipate heat.


Contact Information

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Matt P Hodges whose telephone number is (571) 272-2454. The examiner can normally be reached on 7:30 AM to 4:00 PM M-F.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Nimesh Patel can be reached on (571) 272-2457. The fax phone number for the organization where this application or proceeding is assigned is (571) 273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

mph


ASHOK PATEL
PRIMARY EXAMINER